AF

120

Docket No. 2001-021-TAP

PATENT

#10
MDJ
8-9-04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Dee** §

Serial No. **09/894,378** §

Filed: **June 29, 2001** §

For: **Apparatus and Method of Making a Reduced Sensitivity Spin Valve Sensor Apparatus in which a Flux Injection Efficiency is Reduced** §

Group Art Unit: **2653**

Examiner: **Castro, Angel A.**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ATTENTION: Board of Patent Appeals and Interferences

Certificate of Mailing Under 37 C.F.R. § 1.8(a)
I hereby certify this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on July 21, 2004

By: Amy Miller
Amy Miller

APPELLANT'S BRIEF (37 C.F.R. 1.192)

This brief is in furtherance of the Notice of Appeal, filed in this case on May 21, 2004.

The fees required under § 1.17(c), and any required petition for extension of time for filing this brief and fees therefore, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is transmitted in triplicate. (37 C.F.R. 1.192(a))

07/27/2004 ADSMAN1 00000026 194545 09894378
01 FC:1402 330.00 DA

REAL PARTIES IN INTEREST

The real party in interest in this appeal is the following party: Storage Technology Corporation.

RELATED APPEALS AND INTEREERENCES

With respect to other appeals or interference's that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, there are no such appeals or interference's.

STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application are: 1-14.

B. STATUS OF ALL THE CLAIMS IN APPLICATION

1. Claims canceled: 1, 2, 8, and 9.
2. Claims withdrawn from consideration but not canceled: None.
3. Claims pending: 3-7, and 10-14.
4. Claims allowed: None.
5. Claims rejected: 3-7 and 10-14.

C. CLAIMS ON APPEAL

The claims on appeal are: 3-7, and 10-14.

STATUS OF AMENDMENTS

No amendments were made in response to the final Office action.

SUMMARY OF INVENTION

The present invention provides a reduced sensitivity spin valve head for magnetic tape applications. (page 6, lines 5-6.) The reduced sensitivity spin valve sensor is accomplished by reducing one or more of a basic sensitivity of a spin valve sensor, the flux carrying capability of a free layer, or a flux injection efficiency of the spin valve head structure (page 6, lines 11-15).

ISSUES

1. Whether claims 3-7 and 10-14 are properly rejected under 35 USC 103(a) as unpatentable over Suzuki (USPN 6134078) in view of Cain et al. (USPN 5493467).

GROUPING OF CLAIMS

The claims stand or fall together.

ARGUMENT

Applicant's respectfully submit that the combination of Suzuki and Cain is not proper, and even if it were, it would not teach the claimed invention. Claim 3 is reproduced for discussion:

3. A spin valve sensor apparatus, comprising:
   a first spin valve sensor;
   a second spin valve sensor; and

at least one flux guide, wherein a flux generated by the at least one flux guide is shared between the first spin valve sensor and the second spin valve sensor to thereby reduce a sensitivity of the spin valve sensor apparatus.

[Emphasis added.]

1. Suzuki refers to MR sensors, while the present invention refers to spin valve sensors. Cain also refers to spin valve sensors. Because MR sensors and spin valve sensors have order of magnitude difference in sensitivities, it would not be obvious to combine Suzuki and Cain to form the present invention.

On page 3 of the final Office action, Examiner admits that Suzuki deals with MR sensors and not spin valve sensors. Examiner states:

> Suzuki does not specifically disclose that the MR sensors are spin valve sensors. Cain et al. discloses a yoke spin valve MR read head (figure 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to privide the reduced sensitivity sensor apparatus of Suzuki with the spin valve sensors as taught by Cain et al.

It is respectfully pointed out that MR sensors are intrinsically different from spin valve sensors, also known as giant magnetoresistive sensors (GMR sensors). The two classes of sensors are mutually exclusive, and MR sensors cannot be spin valve sensors. Hence, applicant respectfully submits that Suzuki does not "specifically disclose that the MR sensors are spin valve sensors" because MR sensors cannot be spin valve (*i.e.*, GMR) sensors.

Examiner argues that although Suzuki doesn't mention spin valve sensors, it is still obvious to combine Cain's teachings (which deal with spin valve sensors) with Suzuki's teachings. However, MR sensors, as taught by Suzuki, are of lower sensitivity than GMR or spin valve sensors, which are up to 20 times more sensitive. This difference is the source of the problem addressed by the present invention, and makes the combination proposed by Examiner not obvious.

The high sensitivity of spin valve sensors (such as those in Cain) creates a problem when spin valve sensors are used to read older media (such as the media ready by Suzuki's MR sensors)--*i.e.*, the spin valve sensors are too sensitive. Hence, the present invention addresses this

problem by providing a reduced sensitivity spin valve sensor.

However, Suzuki, being only an MR sensor (which already has "reduced" sensitivity compared to a spin valve sensor) and not the more sensitive spin valve sensors, has no need to reduce the sensitivity of its MR sensors to read legacy media--the MR sensors of Suzuki are already in the proper sensitivity range to read older, less densely stored data. So they don't incur the problem of too much sensitivity that spin valve sensors incur in those conditions. Hence, there would be no motive for one of ordinary skill in the art to modify the MR sensors of Suzuki as Examiner claims.

In arguing why it is obvious to combine the teaching of Suzuki with Cain, Examiner characterizes Suzuki at page 3, 4th paragraph of the final Office action as follows:

> One of ordinary skill in the art would have been motivated to provide the reduced sensitivity sensor apparatus of Suzuki with the spin valve sensors as taught by Cain et al. as it would eliminate dependency on the direction of the sense current.

Applicant respectfully submits that, first, the apparatus of Suzuki is not a reduced sensitivity apparatus, it is only an MR sensor with full sensitivity relative to other MR sensors. It is only of less sensitivity when compared to the more recent spin valve sensors, which are of different design and are intended to read media of different storage density and therefore magnetic stripe size. The very problem addressed by the present invention goes to the heart of this difference--older MR sensors are unable to read newer media because they are not sensitive enough, while newer spin valve sensors are unable to read older media because they are too sensitive. The present application points to this issue at page 4, lines 3-18:

> Generally, a variety of different signal flux levels, i.e. levels of the magnetic field generated by the magnetic tape media, can be produce from various data patterns recorded on a magnetic tape. For example, low density patterns present a larger magnetic flux to the spin valve sensor leading to higher signal amplitude than high density patterns which have a lower level of magnetic flux. A spin valve head is typically designed and optimized to read the high density patterns in order to have significant amplitude for signal detection. However, the high input flux from a low density pattern can drive a spin valve sensor designed for high density operation into non-linear portions of the spin valve

response curve. This leads to readback distortions and may even cause the spin valve sensor to magnetically saturate.

Examiner's proposal to combine the two references essentially suggests we transform the MR sensor of Suzuki to the spin valve sensor of Cain while keeping the rest of Suzuki's apparatus. However, such a substitution would completely change the device of Suzuki. In short, one cannot merely substitute a spin valve sensor into the apparatus of Suzuki, which is designed to work with an MR sensor. That would transform the device of Suzuki into a spin valve sensor device, making the other parts of the apparatus (which Examiner cites against the present application) unnecessary and/or incompatible.

Second, the dependency on the direction of the sense current is a necessary trade off and not a strict advantage that would motivate combining the two references. One cannot have an MR sensor that lacks sense current direction dependency, because that is a property of spin valve sensors. Making such a substitution would fail because the remainder of the apparatus of Suzuki is designed to work with an MR sensor. Making the substitution proposed by Examiner would require substituting the entire teaching of Suzuki with that of Cain or another spin valve apparatus. Examiner cannot pick and choose elements that are not compatible with each other in order to piece together the elements of the present invention.

Such a substitution as proposed by Examiner would require radical modification of Suzuki because Suzuki is an MR sensor device, not a spin valve sensor device. "It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Hedges*, 228 U.S.P.Q. 685, 687 (Fed. Cir. 1986).

Further, neither Suzuki nor Cain teaches or suggests a modification as proposed by Examiner. Even if such a modification were possible, which Applicants do not admit, the mere fact that a prior art reference can be readily modified does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Laskowski*, 871 F.2d 115, 10 U.S.P.Q.2d 1397 (Fed. Cir. 1989) and also *see In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992) and *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1993). The

examiner may not merely state that the modification would have been obvious to one of ordinary skill in the art without pointing out in the prior art a suggestion of the desirability of the proposed modification.

In the present case, Examiner has cited nothing in the references suggesting the desirability of such a modification.

2. Neither device teaches a reduced sensitivity spin valve sensor. Suzuki teaches a full sensitivity MR sensor, while Cain teaches a full sensitivity spin valve sensor. Combining the two would not produce a reduced sensitivity spin valve sensor as claimed.

Even if the two references were properly combinable, which Applicant's do not agree, the combination would not produce the claimed invention. Suzuki teaches an MR sensor, and does not mention or describe reducing the sensitivity of the MR sensor. To the contrary, Suzuki is directed to producing a high sensitivity low distortion MR head. Suzuki addresses the problem of choosing between MR heads with a yoke (which moves them a slight distance from the media and thereby decreases sensitivity) and one disposed just above the media. The yoke style, while less sensitive, has advantages in that it is more reliable. Suzuki is aimed at retaining the reliability of the yoke while **increasing** the sensitivity to match that of the MR sensor disposed just above the media.

Hence, Suzuki is concerned not with reducing sensitivity, but with increasing it, and not in a spin valve sensor, but in a MR sensor. Suzuki does not teach or suggest a reduced sensitivity spin valve sensor.

Cain does teach a spin valve sensor apparatus, but Examiner only cites Cain to substitute wholesale the spin valve sensor of Cain into the apparatus of Suzuki. For the reasons described above, Applicants respectfully submit that such a substitution would not work. Further, Cain has no teaching or suggestion of reducing the sensitivity of the spin valve sensor. To the contrary, Cain teaches a high sensitivity spin valve sensor. For example, Cain's abstract states in the last sentence:

> The signal strength of the yoke spin valve MR sensor is superior to an anisotropic MR sensor and is easier to fabricate.

Therefore, the rejection of claims 3-7 and 10-14 under 35 U.S.C. § 103 has been overcome. Favorable reconsideration of the claims is respectfully requested.

Patrick C. R. Holmes
Reg. No. 46,380
YEE & ASSOCIATES, P.C.
PO Box 802333
Dallas, TX 75380
(972) 367-2001

APPENDIX OF CLAIMS

1-2. (Canceled)

3. (Original) A spin valve sensor apparatus, comprising:

a first spin valve sensor;

a second spin valve sensor; and

at least one flux guide, wherein a flux generated by the at least one flux guide is shared between the first spin valve sensor and the second spin valve sensor to thereby reduce a sensitivity of the spin valve sensor apparatus.

4. (Original) The spin valve sensor apparatus of claim 3, wherein the sharing of the flux between the first spin valve sensor and the second spin valve sensor reduces a flux injection efficiency of the spin valve sensor apparatus.

5. (Original) The spin valve sensor apparatus of claim 3, wherein the at least one flux guide includes a top flux guide and a bottom flux guide.

6. (Original) The spin valve sensor apparatus of claim 5, wherein the top flux guide is positioned between the first spin valve sensor and the second spin valve sensor, and the bottom flux guide is positioned nearest a side of the second spin valve sensor that is furthest away from the first spin valve sensor.

7. (Original) The spin valve sensor apparatus of claim 3, further comprising planars, wherein the second spin valve sensor is positioned on the planars.

8-9. (Canceled)

10. (Original) A method of making a spin valve sensor apparatus, comprising:

providing a first spin valve sensor;

providing a second spin valve sensor; and

providing at least one flux guide, wherein a flux generated by the at least one flux guide is shared between the first spin valve sensor and the second spin valve sensor to thereby reduce a sensitivity of the spin valve sensor apparatus.

11. (Original) The method of making a spin valve sensor apparatus of claim 10, wherein the sharing of the flux between the first spin valve sensor and the second spin valve sensor reduces a flux injection efficiency of the spin valve sensor apparatus.

12. (Original) The method of making a spin valve sensor apparatus of claim 10, wherein providing the at least one flux guide includes providing a top flux guide and a bottom flux guide.

13. (Original) The method of making a spin valve sensor apparatus of claim 12, wherein providing the top flux guide includes positioning the top flux guide between the first spin valve sensor and the second spin valve sensor, and providing the bottom flux guide includes positioning the bottom flux guide nearest a side of the second spin valve sensor that is furthest

away from the first spin valve sensor.

14. (Previously Presented) The method of making a spin valve sensor apparatus of claim 13, further comprising providing planars, wherein providing the second spin valve sensor includes positioning the second spin valve sensor on the planars.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Dee**	§	Group Art Unit: **2653**
Serial No.: **09/894,378**	§	Examiner: **Castro, Angel A.**
Filed: **June 29, 2001**	§	Attorney Docket No.: **2001-021-TAP**
For: **Apparatus and Method of Making a Reduced Sensitivity Spin Valve Sensor Apparatus in which a Flux Injection Efficiency is Reduced**	§	

Certificate of Mailing Under 37 C.F.R. § 1.8(a)
I hereby certify this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on July 21, 2004
By: Amy Miller
Amy Miller

TRANSMITTAL DOCUMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:
ENCLOSED HEREWITH:

- Appellant's Brief (in triplicate) (37 C.F.R. 1.192); and
- Our return postcard.

A fee of $330.00 is required for filing an Appellant's Brief. Please charge this fee to Storage Tek Corporation Deposit Account No. 19-4545. No additional fees are believed to be necessary. If, however, any additional fees are required, I authorize the Commissioner to charge these fees which may be required to Storage Tek Corporation Deposit Account No. 19-4545. No extension of time is believed to be necessary. If, however, an extension of time is required, the extension is requested, and I authorize the Commissioner to charge any fees for this extension to Storage Tek Corporation Deposit Account No. 19-4545.

Respectfully submitted,

Duke W. Yee
Registration No. 34,285
YEE & ASSOCIATES, P.C.
P.O. Box 802333
Dallas, Texas 75380
(972) 367-2001
ATTORNEY FOR APPLICANT